

Hydatid cyst of interventricular septum causing left anterior hemiblock

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A case is reported of left anterior hemiblock and right bundle-branch block produced by a hydatid cyst of the interventricular septum. The electrocardiographic changes are attributed to the great distortion produced by the cystic mass in the septum, with elongation of the right and left anterior bundles. The depth of the S waves in leads II, III, and aVF is in close relation with the degree of left anterior hemiblock.

Cardiac involvement by echinococcosis is rare. The frequency is about 0.5 to 2 per cent of all echinococcus disease.

The more frequent electrocardiographic changes are T wave inversion when the cyst is located in the ventricles (Di Bello *et al.*, 1963, 1967; Fiaschi, 1962; Heilbrunn, Kittle, and Dunn, 1963; Gibson, 1969), P wave deformity with an atrial cyst (de los Arcos *et al.*, 1970), and QRS widening with right bundle-branch block when the echinococcus lesion is located in the interventricular septum (Artucio *et al.*, 1962).

This paper reports an unusual case: a very large hydatid cyst of the interventricular septum produced infundibular pulmonary stenosis and electrocardiographic changes of left anterior hemiblock with right bundle-branch block.

Case report

An asymptomatic 11-year-old boy attended the Cardiac Division of the Navarra Hospital in February 1969, for evaluation of an abnormal cardiac shadow. Five years before admission he was studied at another cardiac centre and a diagnosis of infundibular pulmonary stenosis with a systolic gradient of 20 mmHg was verified. On auscultation, a systolic murmur and a split second sound were heard in the pulmonary area. The x-ray examination of the thorax showed an abnormal cardiac shadow (Fig. 1).

The electrocardiogram revealed normal sinus rhythm. An rS pattern was observed in leads II, III, and aVF with very deep S waves, shifting the mean QRS axis to the left (-60°) (Fig. 2). A Q wave was present in leads I, V1, V2, and V3 with

S wave in I and all the praecordial leads. A small r' was present in lead V4R. The QRS interval was 0.13 sec in lead II. The electrocardiographic changes were interpreted as left anterior hemiblock associated with right bundle-branch block.

Withdrawal pressure tracings during right cardiac catheterization showed infundibular pulmonary stenosis with a systolic gradient of 80 mmHg. No abnormality was observed during left arterial retrograde cardiac catheterization.

Right ventriculotomy under extracorporeal circulation revealed a hydatid cyst 10 cm in diameter in the interventricular septum. The cystic adventitia was opened and the cyst was removed.

The postoperative electrocardiogram (Fig. 3) showed QRS interval widening to 0.16 sec. The mean QRS axis was not modified but the degree of right bundle-branch block was increased.

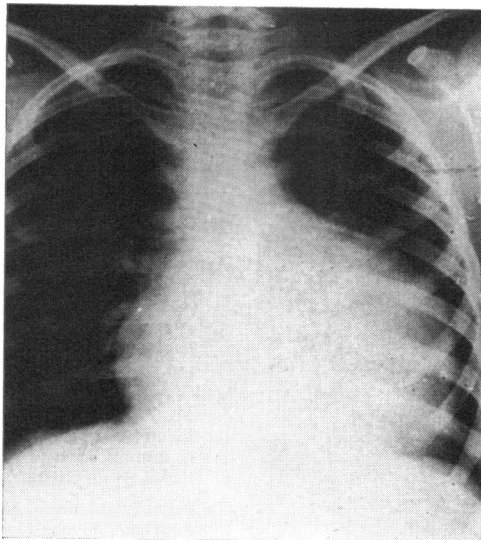


FIG. 1 Chest x-ray.

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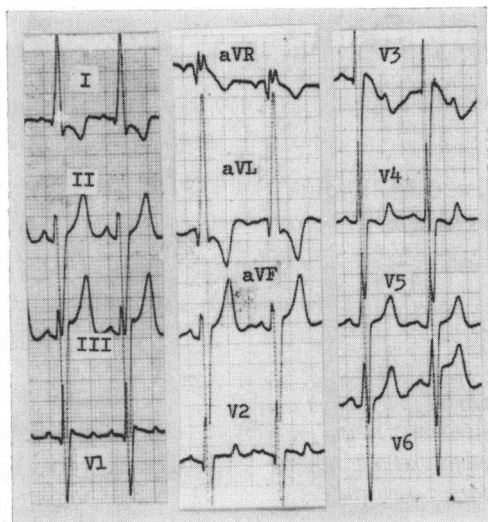


FIG. 2 Preoperative electrocardiogram.

Discussion

Rosenbaum, Elizari, and Lazzari in 1968 and later in 1969 (Rosenbaum *et al.* 1969a, b), established the basis for the diagnosis of left anterior hemiblock: (1) a mean QRS axis of approximately -60° in the frontal plane with

deep S waves in leads II, III, and aVF; (2) small r waves in leads II, III, and aVF with a small Q wave in lead I; (3) normal QRS interval or QRS widening not greater than 0.02 sec.

Their study was based on cases of arteriosclerotic and Chagas's myocardiopathy, and they attributed the abnormal shifting of the QRS axis to an anatomical lesion in the left anterior bundle-branch.

In the case reported here, the probable cause of the left anterior hemiblock and the right bundle-branch block was the great elongation of both branches produced by the cyst. The main mass of the echinococcus cyst was situated in the superior part of the interventricular septum and, for this reason, it affected the right and the left anterior (or superior) branches.

The electrocardiographic image of this case is included in the fourth group of Rosenbaum *et al.*'s classification, with very deep S waves in leads II, III, and aVF. A comparative study of this electrocardiogram and the anatomical aspect of the septum in the surgical procedure enables us to consider that the depth of the S waves is in close relation with the degree of left anterior hemiblock. The tall R wave in lead aVI has similar significance.

The abnormal initial vector in the horizontal plane, producing a Q wave in right precardial leads, can be considered to be an exaggeration of the left anterior hemiblock.

The considerable widening of the QRS interval may be due to elongation or damage of the connexion fibres between the two bundles. The horizontal anatomical position of the heart contributes to the shifting of the horizontal QRS forces backward, producing prominent S waves in the precardial leads.

The postoperative widening of the QRS interval was attributed to surgical damage in the right bundle.

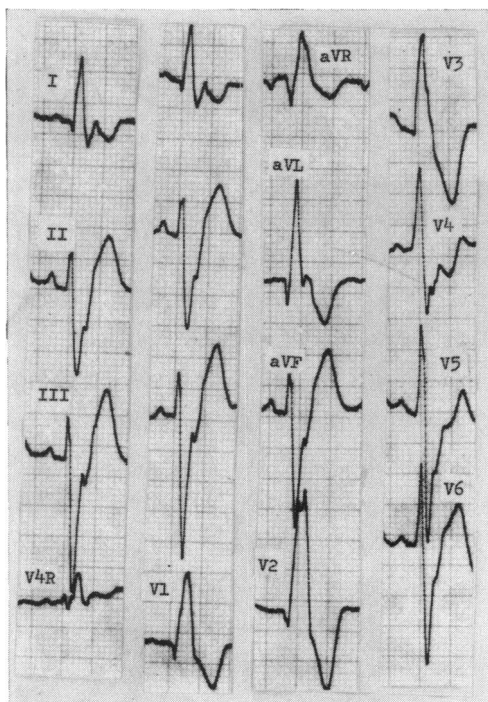


FIG. 3 Postoperative electrocardiogram.

References

- Artucio, H., Roglia, J. L., Di Bello, R., Dubra, J., Gorlero, A., Polero, J., and Artucio Urioste, H. (1962). Hydatid cyst of the interventricular septum of the heart with rupture into the right ventricle. *Journal of Thoracic and Cardiovascular Surgery*, **44**, 110.
- de los Arcos, E., Urquia, M., Perez Leon, J., Madurga, M. P., and Martinez, J. L. (1970). Alteraciones Electrocardiográficas en la Hidatidosis Cardíaca. Communication to the X Reunión de la Sociedad Española de Cardiología, Benalmadena, Malaga.
- Di Bello, R., Mantero, M. E., Dubra, J., and Sinjanés, A. (1967). Hydatid cyst of the left ventricle of the heart. Acute hydatid pericarditis. *American Journal of Cardiology*, **19**, 603.

- Di Bello, R., Rubio, R., Dighiero, J., Zubiaurre, L., and Cortés, R. (1963). Pseudo-aneurysmatic form of cardiac echinococcosis. Report of a new case and review of the literature. *Journal of Thoracic and Cardiovascular Surgery*, **45**, 657.
- Fiaschi, E. (1962). Intorno ad un caso di idatidosi del cuore. *Minerva Medica, Parte scientifica*, **53**, 1235.
- Gibson, D. S. (1969). Cardiac hydatid cysts. *Thorax*, **19**, 151.
- Heilbrunn, A., Kittle, C. F., and Dunn, M. (1963). Surgical management of echinococcal cysts of the heart and pericardium. *Circulation*, **27**, 219.
- Rosenbaum, M. B., Elizari, M. V., and Lazzari, J. O. (1968). *Los Hemibloqueos*. Paidós, Buenos Aires.
- Rosenbaum, M. B., Elizari, M. V., Lazzari, J. O., Nau, G. J., Levi, R. J., and Halpern, M. S. (1969a). Intra-ventricular trifascicular blocks. The syndrome of right bundle branch block with intermittent left anterior and posterior hemiblock. *American Heart Journal*, **78**, 306.
- Rosenbaum, M. B., Elizari, M. V., Levi, R. J., Nau, G. J., Pisani, N., Lazzari, J. O., and Halpern, M. S. (1969b). Five cases of intermittent left anterior hemiblock. *American Journal of Cardiology*, **24**, 1.